Math 1

Exam 3 Review

Exam 3 will be on Thursday, November 3. All of the standards from module 3 will be on the exam. These standards are:

- **3A**: **arithmetic sequences** Students determine recursive and explicit forms of arithmetic sequences and translate between the forms.
- **3B**: **geometric sequences** Students determine recursive and explicit forms of geometric sequences and translate between the forms.
- **3C**: **model linear** Students model situations involving linear growth.
- **3D**: **model exponentials** Students model situations involving exponential growth.
- **3E**: **determine sequence** Students determine the type of sequence with which they are working.

In order to assess standard 3E, it does make sense to label problems with standards, as that would give away the type of sequence. Thus, for the sake of consistency, no standard labels are on any problems.

There are ten problems on the exam; however, of the first six problems, students only need to complete four. (Students may complete more than four if time permits.) The last four problems on the exam are compulsory.

Fun Facts About Sequences

Arithmetic sequences have a common difference d. Thus, the portion of the recursive formula that tells how to get from one term to the next is of the form

$$f(n+1) = f(n) + d.$$

Also, if any arithmetic sequence is graphed, the points will be collinear, and the slope of the line will be d. Assuming that the arithmetic sequence starts at $n = 1$, its explicit formula is of the form

$$f(n) = d(n-1) + f(1).$$

You will need to adjust if the starting value is different.

Geometric sequences have a common ratio r. Thus, the portion of the recursive formula that tells how to get from one term to the next is of the form

$$f(n+1) = f(n) \cdot r.$$

Also, if any geometric sequence is graphed, the points will lie on one exponential curve (if $r > 0$ and $r \neq 1$) or two exponential curves (if $r < 0$ and $r \neq -1$). Assuming that the geometric sequence starts at $n = 1$, its explicit formula is of the form

$$f(n) = f(1) \cdot r^{n-1}.$$

You will need to adjust if the starting value is different.

Note that, for geometric sequences, we rarely deal with the cases $r = -1$, $r = 0$, and $r = 1$.

Sequences that are neither arithmetic nor geometric may have recursive and explicit forms; however, even if they do exist, they may be difficult to determine. Not all sequences (even those whose outputs are all numbers) have definite patterns.